

Claims

We claim:

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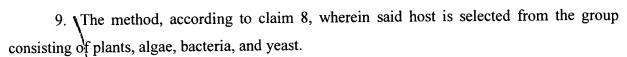
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- 1. A method for pest control wherein said method comprises exposing said pest to a compound which disrupts, within said pest, an organic solute transporter/ligand-gated ion channel protein.
 - 2. The method, according to claim 1, wherein said method comprises exposing said pest to a compound which disrupts the function of a CAATCH1 protein.
 - 3. The method, according to claim 2, wherein said CAATCH1 protein comprises the amino acid sequence shown in SEQ ID NO: 2, or a portion of said sequence wherein said portion has CAATCH1 biological activity.
 - 4. The method, according to claim 1, wherein said method comprises exposing said pest to an amino acid which disrupts said organic solute transporter/ligand-gated ion channel protein.
- 5. The method, according to claim 4, wherein said amino acid is selected from the group consisting of methionine, leucine, histidine, glycine, threonine, beta-alanine, alanine and their analogs; wherein, for each amino acid, the amino acid may be in a racemic mixture or in an enantiomerically-enriched L- or D- form.
 - 6. The method, according to claim 5, wherein said amino acid is methionine or leucine.
 - 7. The method, according to claim 6, wherein said amino acid is methionine.
 - 8. The method occording to claim 1, which comprises exposing said pest to a host which has been transformed to express said compound.

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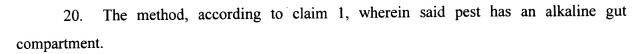


10. The method, according to claim 9, wherein said host is a plant.

11. The method, according to claim 10, wherein said plant is selected from the group consisting of the Family Solanacae; Solanum spp.; Glycine spp.; Family Fabaceae; Zea mays;

- 10 12. The method, according to claim 1, wherein said pest is selected from the group consisting of Lepidopterans, Coleopterans, and Diptera.
 - 13. The method, according to claim 12, wherein said pest is in the order Coleoptera.
- 15 14. The method, according to claim 13, wherein said coleopteran is a Leptinotarsa spp., rootworm, or weevil.
 - 15. The method, according to claim 12, wherein said pest is in the order Diptera.
 - 16. The method, according to claim 15, wherein said lepidopteran is selected from the group consisting of cutworms, budworms, leafworms, earworms, and armyworms.
 - 17. The method, according to claim 12, wherein said pest is in the order Diptera.
- 25 18. The method, according to claim 17, wherein dipteran is a mosquito.
 - 19. The method, according to claim 1, wherein said pest is selected from the group consisting of cockroaches, ants, termites, and nematodes.

Zea spp. and Nicotina spp.



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- 21. The method, according to claim 1, wherein said pest has a V-type ATPase.
- 22. The method, according to claim 1, wherein said pest has a protein encoded by a gene which hybridizes, under high stringency conditions, with at least 15 contiguous bases of SEQ. ID NO::1, or the complement of SEQ ID NO: 1.
- 23. The method, according to claim 1, wherein said compound is selected from the group consisting of antibodies, antisense polynucleotides, and RNAi.
- 24. The method, according to claim 23, wherein said antibody immunoreacts with a CAATCH1 protein.

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25. The method, according to claim 24, wherein said CAATCH1 protein comprises SEQ ID NO: 2, or a portion thereof which has CAATCH1 biological activity.

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- 26. The method, according to claim 23, wherein said antisense polynucleotide or RNAi targets a sequence of at least 15 contiguous bases of SEQ ID NO: 1, its complement, or corresponding RNA, or sequences upstream or downstream of SEQ ID NO: 1 in said target pest.
- 27. A composition comprising a pesticidal amount of a compound which disrupts, within a target pest, an organic solute transporter/ligand-gated ion channel protein.
 - 28. The composition, according to claim 27, wherein said compound is an amino acid.
- 29. The composition, according to claim 28, wherein said amino acid is selected from the group consisting of methinine, leucine, histidine, glycine, threonine, beta-alanine, alanine

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and their analogs; wherein, for each amino acid, the amino acid may be in a racemic mixture or in an enantiomerically-enriched L- or D- form.

- 30. The composition, according to claim 29, wherein said amino acid is methionine or leucine.
 - 31. The composition, according to claim 30, wherein said amino acid is methionine.
- 32. The composition, according to claim 27, wherein said composition comprises a transformed host which expresses said compound.
 - 33. The composition, according to claim 32, wherein said host is selected from the group consisting of plants, algae, bacteria, and yeast.
 - 34. The composition according to claim 33, wherein said host is a plant.
 - 35. The composition, according to claim 34, wherein said plant is selected from the group consisting of the Family Solanacae; Solanum spp.; Glycine spp.; Family Fabaceae; Zea mays; Zea spp. and Nicotina spp.
 - 36. A method for identifying a CAATCH1 protein comprising the use of antibodies generated an epitope of SEQ ID NO:2, and detecting binding between said antibodies and said CAATCH1 protein.
- 25 37. A method for detecting CAATCH1 genes comprising the use of an oligonucleotide probe of SEQ ID NO:1, and detecting hybridization between said oligonucleotide probe and a target sequence.
- 38. A method for controlling a pest wherein said method comprises administering to said pest an effective amount of an amino acid or an analog thereof.

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39. The method, according to claim 38, wherein said amino acid is selected from the group consisting of methionine, leucine, histidine, glycine, threonine, beta-alanine, alanine and their analogs; wherein, for each amino acid, the amino acid may be in a racemic mixture or in an enantiomerically-enriched L- or D- form.

